UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 36518

CR NO. 82

OVER THE

W. FORK OF THE BLACK RIVER

DISTRICT 1 - KOOCHICHING COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 36518, Piers 1 and 2, were found to be in good to satisfactory condition with no defects of structural significance observed. The protective coating has begun to fail over 10 to 25 percent of the steel pile surface area with 1/4 inch rust nodules and 1/32-inch-deep pitting observed. The shoreline was well armored with 1 to 2 foot diameter riprap, however, the west embankment exhibited vertical bank erosion near Pier 1. The channel bottom around the substructure units appeared stable with no evidence of significant scour.

INSPECTION FINDINGS:

(A) The steel pipe piles exhibited coating failure with up to 1/4-inch-diameter rust nodules and up to 1/32-inch-deep pitting over 10 to 25 percent of their surface area from the channel bottom to 5 feet above the waterline

(B) An area of vertical bank erosion was observed at Pier 1. The embankment extended out to Pier 1 and exhibited 5 feet of vertical erosion above the waterline at the upstream and downstream noses of Pier 1.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years. Note that the substructure units could be inspected using waders during periods of low water levels.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 36518

Feature Crossed: The West Fork of the Black River

Feature Carried: CR No. 82

Location: District 1 - Koochiching County

Bridge Description: The bridge superstructure consists of three spans of timber deck and stringers. The superstructure is supported by two steel pipe pile piers and concrete abutments. The two piers are designated as Piers 1 and 2 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg
State of Minnesota, P.E., No. 21491

Dive Team: Michelle D. Koerbel, Matthew J. Lengyel

Date: August 25, 2002

Weather Conditions: Sunny, ± 85^{o} F

Underwater Visibility: ± 2 feet

Waterway Velocity: ± 1.5 fps

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: Each of the piers consists of a single row of five steel pipe piles under a common concrete cap. The abutments and their skewed wingwalls are constructed of concrete.

Maximum Water Depth at Substructure Inspected: Approximately 1.5 feet

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the downstream end of Pier 2.

Water Surface: The waterline was approximately 15.2 feet below reference. Assumed Waterline Elevation = 84.8.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

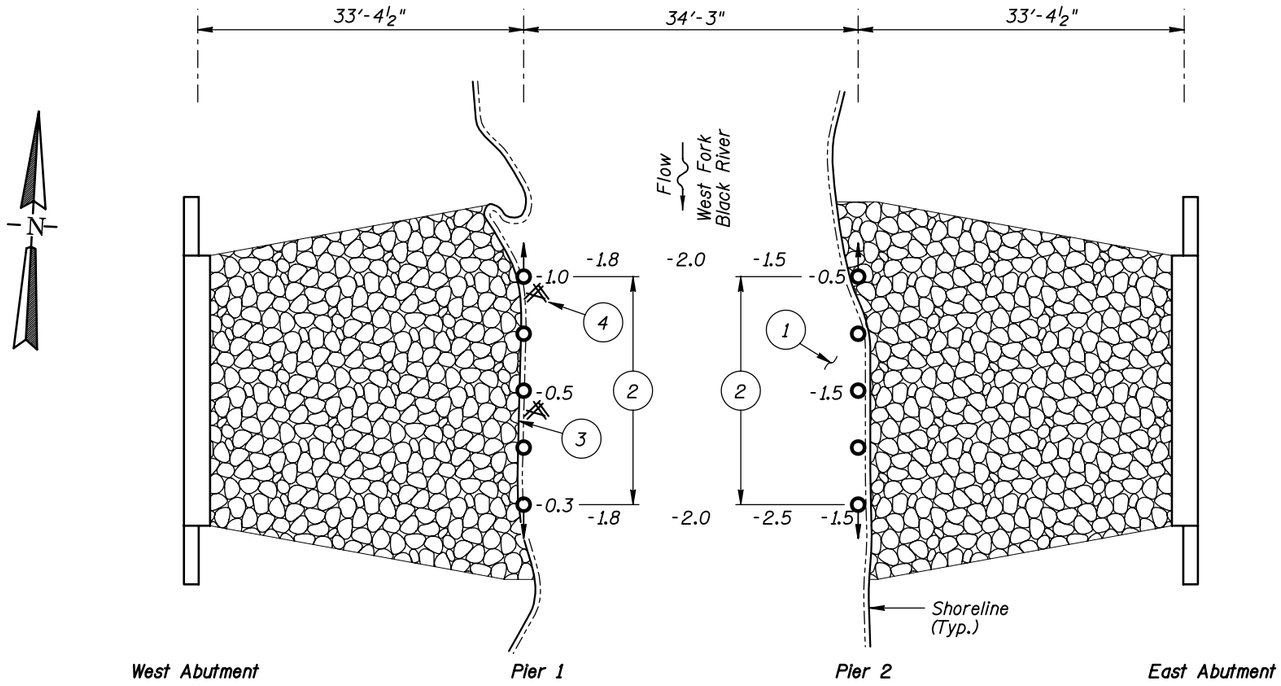
Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code A/08/02

Item 113: Scour Critical Bridges: Code K/02

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

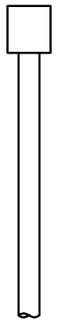
_____ Yes ___X__No



SOUNDING PLAN

Note:

Pier caps not shown for clarity.



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on August 25, 2002, the waterline was located approximately 15.2 feet below the top of pier cap at downstream end of Pier 2. Since insufficient bridge elevation information was available a reference elevation of 100.0 was assumed. Based on the assumed reference the waterline elevation was 84.8.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom consisted of 1- to 2-foot-diameter riprap and silt with approximately 6 inches of probe rod penetration.

(2) The steel pipe piles exhibited coating failure with up to 1/4-inch-diameter rust nodules and up to 1/32-inch-deep pitting over 10 to 25 percent of their surface area from the channel bottom to 5 feet above the waterline.

(3) Area of vertical embankment erosion 5 feet above the waterline.

(4) 6-inch-diameter and smaller timber debris scattered along the pier.

Legend

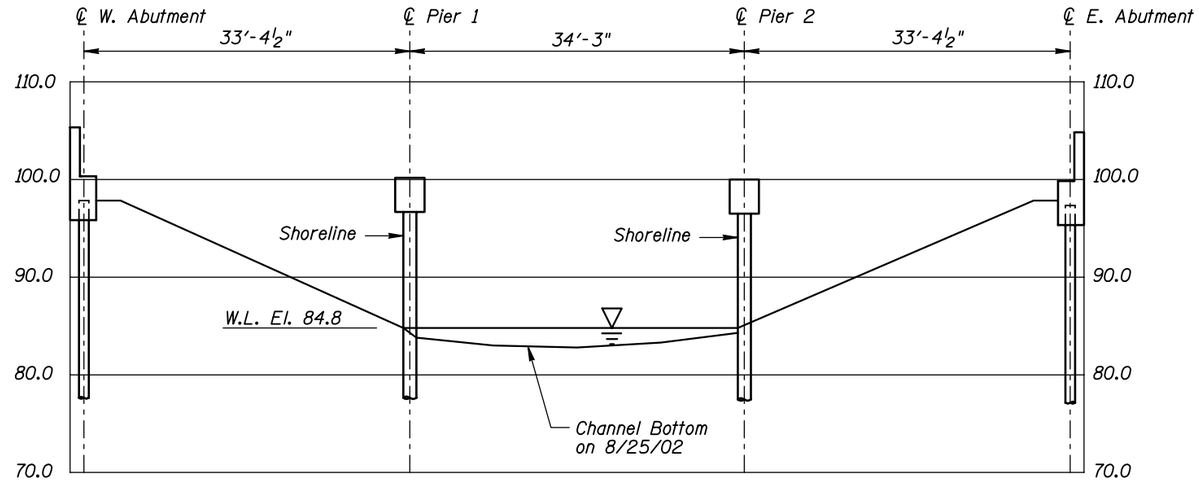
-2.0	Sounding Depth from Waterline (8/25/02)
O	16" Diameter Steel Pipe Pile
O—	Battered 16" Diameter Steel Pipe Pile
	Timber Debris
	Riprap

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

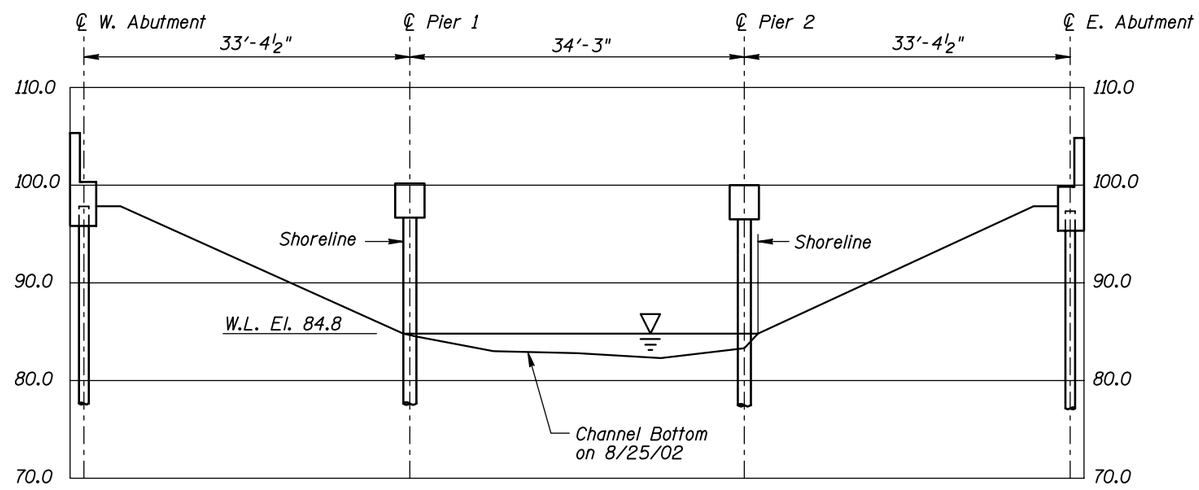
STRUCTURE NO. 36518
OVER THE WEST FORK OF THE BLACK RIVER
DISTRICT 1, KOOCHICHING COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 351236518		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 36518
OVER THE WEST FORK OF THE BLACK RIVER
DISTRICT I, KOOCHICHING COUNTY

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	**COLLINS ENGINEERS, INC.**	Date: AUG. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1/16"=1'
Code: 351236518		Figure No.: 2

Photograph 1. Overall View of Structure, Looking South.

Photograph 2. View of Pier 1, Looking Northwest.

Photograph 3. View of Pier 2, Looking Northeast.

Photograph 4. View of Typical Corrosion of Piles, Looking Southwest.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 25, 2002
ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E. 21491
BRIDGE NO: 36518 WEATHER: Sunny, "85° F
WATERWAY CROSSED: The W. Fork of the Black River
DIVING OPERATION: SCUBA SURFACE SUPPLIED AIR
X OTHER Wading due to low water
PERSONNEL: Michelle D. Koerbel, Matthew J. Lengyel
EQUIPMENT: U/W Light, Scraper, Lead Line, Probe Rod, Camera
TIME IN WATER: 11:30 A.M.
TIME OUT OF WATER: 11:50 A.M.
WATERWAY DATA: VELOCITY "1.5 fps
VISIBILITY "2 feet
DEPTH 1.5 feet maximum at Pier 2
ELEMENTS INSPECTED: Piers 1 and 2
REMARKS: Overall, the steel piles were in good to satisfactory condition. From 5 feet above the waterline to the mudline, the coating has begun to fail over 10 to 25 percent of the steel pile surface area with light to moderate corrosion consisting of up to 1/4 inch rust nodules and 1/32 inch pitting. The shoreline was well armored with 1 to 2 foot diameter riprap, however, the west embankment exhibited vertical erosion along Pier 1, with the shoreline 5 feet above the waterline. A light accumulation of 6 inch diameter and smaller timber debris was scattered along Pier 1.

FURTHER ACTION NEEDED: _____ YES ___X___ NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years. Note that the substructure units could be inspected using waders during periods of low water levels.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 36518
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E. 21491
WATERWAY CROSSED W. Fork of Black River

INSPECTION DATE August 25, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	1.0’	7	N	N	9	7	7	8	7	8	7	7	N	7	N	7	N	N
	Pier 2	1.5’	7	N	N	9	8	7	8	8	8	8	8	N	7	N	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the steel piles were in good to satisfactory condition. From 5 feet above the waterline to the mudline, the coating has begun to fail over 10 to 25 percent of the steel pile surface area with light to moderate corrosion consisting of up to 1/4 inch rust nodules and 1/32 inch pitting. The shoreline was well armored with 1 to 2 foot diameter riprap, however, the west embankment exhibited vertical erosion along Pier 1, with the shoreline 5 feet above the waterline. A light accumulation of 6 inch diameter and smaller timber debris was scattered along Pier 1.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.